OHIO AGRICULTURAL EXPERIMENT STATION

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Mortality in Ohio Hardwoods

By

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Mortality is a problem worthy of special consideration in the handling of Ohio's hardwood timber. With many stands still unmanaged, many others in just the first phases of management, and a history of unplanned cutting, fire, grazing, and high grading, it is natural to expect a mortality problem of some magnitude.

Unfortunately, except in the case of major catastrophe, mortality is not too obvious. Normal cruising and marking operations do not lend themselves to more than an observation of volume loss with no concrete determination of the time over which it has occurred.

In its experimental forests, the Forestry Department of the Ohio Agricultural Experiment Station has over 1,300 permanently established 1/5-acre plots with individually numbered trees. These are remeasured at from 1 to 5-year intervals and are well suited to the determination of mortality for a specific period of time.

Five cases are listed below. Volumes are net, International $\frac{1}{4}$" Rule.

Woods 6 - Beech-maple, Geauga Co. - 18 acres - Acres of sample, 9 - Period, 5 years.

Stand-all aged, diameter to 36", diameter class with greatest volume - 20".

Management - Fair, partial cut 10 years ago - evidently mild high grading.

Volume per Ac.	Mortality /Ac./Yr.	Growth /Ac./Yr.	Ingrowth /Ac./Yr.	Net Increase /Ac./Yr.
8,450 Bd.Ft.	47 Bd.Ft.	157 Bd.Ft.	49 Bd.Ft.	159 Bd.Ft.

Woods 7 - Beech-maple, Geauga Co. - 28 acres - Acres of sample, 9 - Period, 5 years.

Stand - all-aged, very few trees over 24", diameter class with greatest volume - 18".

Management - poor, occasional cutting of firewood from cull trees. Considerable amount of defective poor growing stock.

Volume per Ac.	Mortality /Ac./Yr.	Growth /Ac./Yr.	Ingrowth /Ac./Yr.	Net Increase /Ac./Yr.
5,350 Bd.Ft.	55 Bd.Ft.	112 Bd.Ft.	29 Bd.Ft.	86 Bd.Ft.

Woods 2 - White oak-red oak-black oak and cove hardwoods - Holmes Co. - 42 acres - Acres of sample - 12.2 - Period 5 years.

Stand - all-aged, diameters to 38", diameter class with greatest volume 22". Classes up through 32 run heavy in volume.

Management - fair to poor - partial cut 10 years ago - definitely a high grading.

Volume per Ac.	Mortality /Ac./Yr.	Growth /Ac./Yr.	Ingrowth /Ac./Yr.	Net Increase /Ac./Yr.
8,500 Bd.Ft.	43 Bd.Ft.	172 Bd.Ft.	37 Bd.Ft.	166 Bd.Ft.

Woods 11 - Beech-maple, Columbiana Co. - 20 acres - Acres of sample 6 - Period, 1 yr.

Stand - all-aged - diameters to 28", diameter class of greatest volume - 18".

Management - Good for over 40 years. Cut annually.

Volume per Ac.	Mortality /Ac./Yr.	Growth /Ac./Yr.	Ingrowth /Ac./Yr.	Net Increase /Ac./Yr.
7,000 Bd.Ft.	None (in 5 yrs. time)	212 Bd.Ft.	70 Bd.Ft.	282 Bd.Ft.

Woods 13 - White oak-red oak-black oak, chestnut oak, and cove hardwoods - Pike County - 18 acres - Acres of sample, 8 - Period, 5 years.

Stand - mixed-age classes, diameter distribution showing trend to all-aged with deficit in larger classes. Diameters to 30", diameter class with greatest volume - 14".

Management - none previously. First cut made at 3rd year of period.

Volume per Ac.	Mortality /Ac./Yr.	Growth /Ac./Yr.	Ingrowth /Ac./Yr.	Net Increase /Ac./Yr.
4,800 Bd.Ft.	1.5 Bd.Ft.	136 Bd.Ft.	86 Bd.Ft.	220.5 Bd.Ft.

Except for unforeseen catastrophe, vigorous young stands and well managed frequently cut stands are not ordinarily considered to be subject to heavy mortality. Two of the above cases fall into this category and conform to general expectations.

In the farm woods sections of the state many stands contain old growth remnants. Mortality was expected, but its actual amount was, frankly, a surprise to Experiment Station personnel. These volume losses which often destroy 1/4 to 1/3 the annual growth should serve as a strong incentive for the individual landowner to practice good forestry.

A planned cutting program is the answer, but not a cure-all. The partial cuts in woods 2 and 6 did not stop mortality. Close attention should be given to the details of individual tree-selection. Even a mild form of high-grading not only depletes good growing stock, but also in at least one case has failed in one of the most important objectives of management - to harvest mortality before it occurs.

There is always a question as to how widely data from a few woods can be applied. In this case it is the feeling at the Ohio Station from observations made on other areas, that the mortality in the woods discussed is not unusual. Any timber owner with an unmanaged stand which has much timber over 18 inches is in danger of losing from 1/4 to 1/3 (in some cases more) of his annual growth to mortality.